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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/867,402	05/31/2001	Jun Miyokawa	205471US8	8275

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EXAMINER	
LOUIE, WAI SING	
ART UNIT	PAPER NUMBER
2814	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	09/867,402	MIYOKAWA ET AL.	
	Examiner	Art Unit	
	Wai-Sing Louie	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 November 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 3, 6-17, and 22 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

- In claim 1, "wherein said optical system mounting member is not in contact with said temperature control device" is new matter. In fig. 1 and 2, the optical system mounting member 5-7 clearly in contact with the base 2, which is in contact with the temperature control device 25. The optical system-mounting member 5 is also labeled as base 2 in fig. 1 and, therefore, it is in contact with the temperature control unit 25.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 3, 6-14, 19, 22-23, 26-29, 31, 33-34, 39, and 42 are rejected under 35 U.S.C. 102(a) as being anticipated by Yoshino (US 5,924,290).

With regard to claim 1, Yoshino discloses a laser diode module (col. 5, line 18 to col. 8, line 67 and fig. 2) comprising:

- A laser diode 1 (fig. 2);
- An optical system including an optical fiber 10 and a lens 7, the optical system being configured to receive and transmit a beam emitted from the laser diode through the lens to the optical fiber along an optical axis (fig. 2);
- An optical system mounting member 11 configured to support at least a portion of the optical system (fig. 2);
- A laser diode mounting member (carrier) 3 configured to support the laser diode, the optical system mounting member 11 being attached to the laser diode mounting member 3 (fig. 2);
- A bottom plate 5a configured to support the laser diode 1, the optical system, the optical mounting member 11, and the laser diode-mounting member 3 (fig. 3);
- A temperature control device 6 thermally connected to the laser diode 1 by the laser diode-mounting member 3, the temperature control device being attached to the bottom plate 5a (fig. 2).

With regard to claims 3 and 27, Yoshino discloses the temperature control device is a peltier unit 6, the peltier unit 6 having a top plate 6a member attached to the laser diode

mounting member 3, a bottom plate member 6b attached to the bottom plate, and a peltier element 6c positioned between the top plate member 6a and bottom plate member 6b (fig. 2).

With regard to claim 6, Yoshino discloses the top plate member 6a is made of aluminum oxide. (col. 5, lines 49-50).

With regard to claim 7, Yoshino discloses the optical fiber has a portion contained within a holder 11, where the optical system mounting member comprises a holder mounting member attached the holder (fig. 2).

With regard to claim 8, Yoshino discloses the laser diode-mounting member 3 is made of copper tungsten alloy (col. 5, lines 65-68).

With regard to claim 9, Yoshino discloses the optical system-mounting member could be made of copper tungsten alloy or a Fe-Ni-Co alloy (col. 3, lines 9-10).

With regard to claim 10, Yoshino discloses the laser diode is mounted on a laser diode-bonding portion, the laser-bonding portion being mounted on the laser diode-mounting member (col. 5, lines 56-60).

With regard to claim 11, Yoshino disclose the discrete lens is mounted within the holder 11 (fig. 2).

With regard to claims 12 and 14, Yoshino discloses the optical system comprises an optical isolator 8 supported by the optical system mounting member 11 and the optical system is configured to receive and transmit the beam emitted from the laser diode through the discrete lens and the optical isolator to the optical fiber along the optical axis (fig. 3).

With regard to claim 13, Yoshino discloses the discrete lens is connected to a holder and the optical system-mounting member comprises a holder-mounting member supporting the holder (fig. 2).

With regard to claims 19 and 39, Yoshino discloses the laser diode-mounting member is fixed on the bottom plate 5a via a peltier unit 6 (fig. 2).

With regard to claims 22 and 42, Yoshino discloses the optical system-mounting member 3 is made of CuW alloy, which is non-magnetic (col. 5, lines 65-67).

With regard to claim 23, in addition to the limitations disclosed in claim 1 above, Yoshino also discloses:

- A fastening means 11 for supporting at least a portion of the optical system (fig. 2);
- A base 6a configured to support the laser diode 1 (fig. 2);
- Where the base includes a laser diode-mounting member 3 and a fastening means mounting member 11, the laser diode-mounting member 3 having a laser-mounting region configured to mount the laser diode, the fastening means mounting member 11 being mounted to the laser diode-mounting member at a position other than the laser diode-mounting region (fig. 2).

With regard to claim 26, Yoshino discloses a package 5 including the bottom plate 5a, the package 5 being configured to accommodate the laser diode 1, the fastening means 11, the base 6a and the peltier unit 6 (fig. 2).

With regard to claims 28-29, Yoshino discloses the base 6a and fastening means mounting member 11 project in a direction parallel to an optical axis of the optical system from an end portion on an optical fiber mounting side of the laser diode mounting member 3 (fig. 2).

With regard to claim 31, Yoshino discloses the lens portion has a fiber lens formed on the optical fiber 10, where the fiber lens has a tip end arranged to oppose a light-emitting facet of the laser diode (fig. 2).

With regard to claim 33-34, Yoshino discloses the fastening means and its mounting member are made of CuW alloy or Fe-Ni-Co alloy (col. 3, lines 9-10).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4-5, 15, 20-21, 24-25, 32, and 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshino (US 5,924,290).

With regard to claim 4, in addition to the limitations disclosed in claim 1, Yoshino also disclose:

- Yoshino does not disclose the laser diode-mounting member (carrier) 3 is formed of material having a linear expansion coefficient in range between a linear expansion coefficient of the optical system-mounting member 6 and a linear

expansion coefficient of the first plate member 6c of the thermo module. However, Yoshino discloses the carrier 3 is made of CuW-30 alloy and the first plate member 6c is made of ceramic. The thermal expansion coefficient of both materials are approximate the same (col. 3, lines 6-18).

With regard to claims 5 and 25, in addition to the limitations disclosed in claim 1, Yoshino also disclose:

- Yoshino does not disclose the optical system-mounting member 6c could have a thermal conductivity lower than a thermal conductivity of the laser mounting member (carrier) 3 and the first plate member 6c of the peltier unit (thermo module). However, Yoshino discloses the carrier is made of CuW-30 alloy (col. 5, lines 66-67) and the first plate of the peltier unit is made of ceramic (col. 3, line 7). Yoshino also discloses ceramic and "kovar" has the same thermal expansion coefficient (col. 3, lines 6-18). Kovar is alloy CuW-20%, which has a lower thermal expansion coefficient (col. 5, lines 38-41). Therefore, the first plate 6c of peltier unit has a lower thermal expansion coefficient than the laser diode-mounting member (carrier) 3.

With regard to claim 15, Yoshino does not disclose the bottom plate supports the optical fiber. However, one end of the optical fiber 10 is supported by the package wall 5b, which is connected to the bottom plate 5a. Therefore, it is obvious the optical fiber 10 is supported by the bottom plate (fig. 2).

With regard to claims 20-21 and 40-41, in addition to the limitations disclosed in claim 1 and 18, Yoshino also disclose:

- Yoshino discloses the thermal conductivity, but the unit is different. The temperature, power, time and thermal conductivity are considered to involve routine optimization, which has been held to be within the level of ordinary skill in the art. As noted in In re Aller, the selection of reaction parameters such as temperature and concentration, thickness etc. would have been obvious:

> "Normally, it is to be expected that a change in temperature, or in thickness, or in time, would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art...such ranges are termed "critical ranges and the applicant has the burden of proving such criticality.... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation."

In re Aller 105 USPQ233, 255 (CCPA 1955). See also In re Waite 77 USPQ 586 (CCPA 1948); In re Scherl 70 USPQ 204 (CCPA 1946); In re Irmscher 66 USPQ 314 (CCPA 1945); In re Norman 66 USPQ 308 (CCPA 1945); In re Swenson 56 USPQ 372 (CCPA 1942); In re Sola 25 USPQ 433 (CCPA 1935); In re Dreyfus 24 USPQ 52 (CCPA 1934).

Therefore, one of ordinary skill in the requisite art at the time the invention was made would have used any temperature, power, time, and thermal conductivity range suitable to the method in process in order to optimize the design.

With regard to claim 24, in addition to the limitations disclosed in claim 1, Yoshino also disclose:

- A carrier (base) 3 includes a laser diode-mounting member 2 having a laser diode-mounting region configured to mount the laser diode. Yoshino does not disclose

the laser diode fastening means. However, one with ordinary skill in the art would provide a fastening means for mounting the laser diode and this is a minor device design details.

- Yoshino discloses a peltier unit 6 mounted on the bottom plate 5a, where the laser diode-mounting member is formed (fig. 2). As disclosed in claim 4 above, the construction material of laser diode mounting member could have a similar linear expansion coefficient in between fastening means and the peltier unit 6.

Claims 18, 30, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshino (US 5,924,290) in view of Shimaoka et al. (US 5,195,155).

With regard to claims 18 and 38, in addition to the limitations disclosed in claim 1, Yoshino also disclose:

- The lens portion is a discrete lens supported by the optical system-mounting member 11 (fig. 2).
- Yoshino does not disclose the laser diode-mounting member (carrier) 3 is directly fixed on the bottom plate 5. However, it is common in the art to fix the laser diode-mounting member directly on the bottom plate such as disclosed in Shimaoka et al. (Shimaoka fig. 3). Therefore, it would have been obvious to mount the carrier directly fixed on the bottom plate 5.

With regard to claim 30, Yoshino does not disclose the laser diode-mounting member has a reinforcement portion for mechanically reinforcing the fastening means at a position closest to the laser diode. However, Shimaoka et al. disclose the reinforcing member extending from the

bottom plate 1 to support the optical member 5 (Shimaoka fig. 3). Shimaoka et al. teach this arrangement serve as optical alignment and fine adjustment to the optical fiber mounting system (Shimaoka col. 14, lines 4-19). Therefore, it would have been obvious to one with ordinary skill in the art to modify Yoshino's device with the teaching of Shimaoka et al. to provide the reinforcement member in order to alignment the optical fiber system properly.

Claims 16-17 and 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshino (US 5,924,290) in view of Miki et al. (US 6,094,515).

With regard to claims 16 and 35, Yoshino discloses the module comprises of one lens. However, Miki et al. disclose an optical module having two lenses 16 and 26 (fig. 3). Miki et al. teach lens 26 is a condenser lens and lens 16 is a collimator lens to confine the light into the optical fiber (Miki col. 7, lines 22-33). Therefore, it would have been obvious to one with ordinary skill in the art to provide a second lens in order to confine the light into the optical fiber. Yoshino discloses the optical system is configured to receive and transmit the beam emitted from the laser diode through the lens to the optical fiber along an optical axis (fig. 2).

With regard to claims 17 and 37, Yoshino discloses a package 5 including the bottom plate 5a, the package 5 being configured to support the second lens and the optical fiber 10 (fig. 2).

With regard to claim 32, in addition to the limitations disclosed in claim 1 and 24, Yoshino also disclose:

- Yoshino does not disclose a fiber lens formed on the optical fiber, where the tip end side arranged to oppose a light-emitting facet of the laser diode. However,

Yoshino, modified by Miki et al. in claim 16 above, would disclose a fiber lens formed on the optical fiber. The lens end arranged to oppose a light-emitting facet (fig. 1a). Yoshino does not disclose the lens 7 is an anamorphic lens. However, one skilled in the art would choose a lens to meet the match the output of the laser diode and the configuration of the fiber. Therefore, it is obvious to choose an anamorphic lens if needed.

With regard to claim 36, Yoshino discloses an optical isolator 8 supported by the fastening means mounting member 11 (fig. 2); the optical system comprises a second lens disclosed in claim 16 above; the optical system is configured to receive and transmit the beam emitted from the laser diode through the discrete lens, and optical isolator, and the second lens to the optical fiber along the optical axis (fig. 2).

Response to Arguments

Applicant's arguments filed 11/13/02 have been fully considered but they are not persuasive.

- Applicant argues that the optical system-mounting member 5 is not in contact with the temperature control unit 25. However, the optical system mounting member 5 and is also labeled as 2 in fig. 1, is connect to base 2. Therefore, optical system mounting member is the same as base, which is directly in contact with temperature control unit 25. Yoshino disclose the optical system-mounting member in contact with the temperature control unit (peltier). Thus, Yoshino meets the limitations of claim 1.

- Applicant argues that the laser diode mounting means 22 is not in contact with the temperature control unit 25. However, Yoshino's laser diode mounting means (heat sink 2) is also not in direct contact with the peltier unit (see fig. 2). Yoshino meets the limitations of claim 23.
- Applicant argues that Yoshino does not disclose the thermal expansion coefficients listed in claims 4-5, 18, 20-21, 24, 32, 38, and 40-41 of the thermal control unit 25, the base 2, and the bottom plate 26. However, Yoshino discloses the base plate and the lower plate of the peltier unit are made of Kovar, which is the Cu-W alloy (Yoshino col. 3, lines 6-18 and col. 5, lines 30-41). Kovar is used in the present application in the laser diode-mounting member 8, base side plate 17, and the base 2 [0049]. The Cu-W alloy is used in both Yoshino and the present application. Therefore, Yoshino meets the limitations of the above listed claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (703) 305-0474. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

wsl
January 26, 2003

SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800